



Volunteer Lake Assessment Program Individual Lake Reports

TOM POND, WARNER, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	601	Max. Depth (m):	4.4	Flushing Rate (yr ⁻¹)	3.5
Surface Area (Ac.):	32	Mean Depth (m):	2.5	P Retention Coef:	0.57
Shore Length (m):	1,600	Volume (m ³):	314,000	Elevation (ft):	383

TROPHIC CLASSIFICATION

Year	Trophic class
1998	MESOTROPHIC
2006	MESOTROPHIC

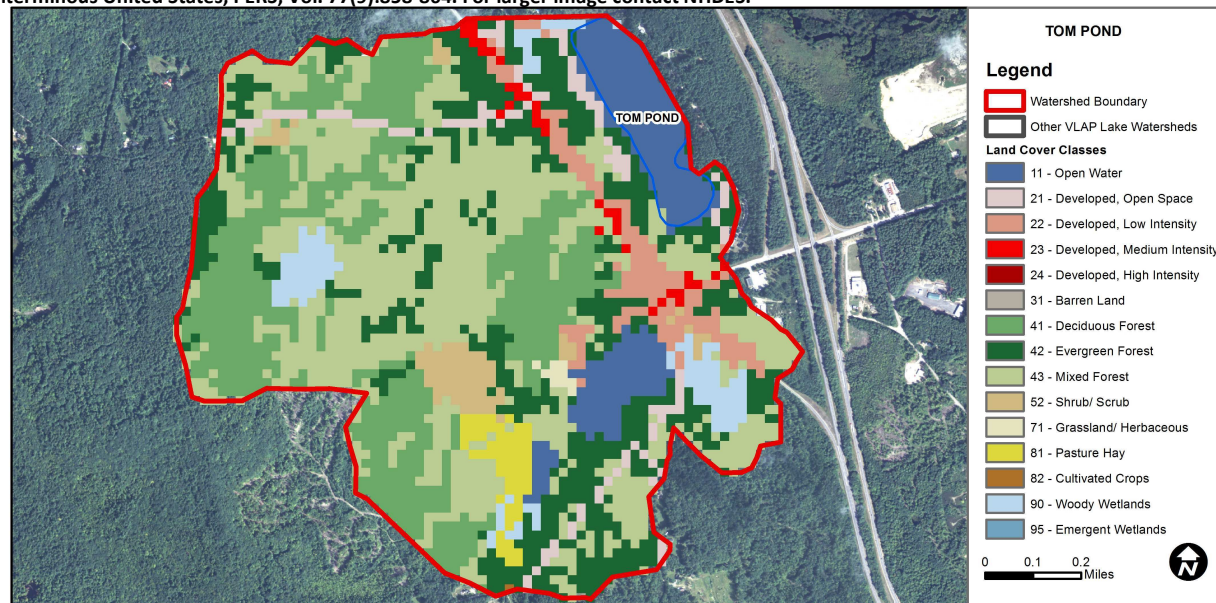
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen saturation	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Slightly Bad	There are >10% of samples (minimum of 2), exceeding indicator.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	8.48	Barren Land	0	Grassland/Herbaceous	0.32
Developed-Open Space	3.66	Deciduous Forest	21.77	Pasture Hay	1.97
Developed-Low Intensity	4.56	Evergreen Forest	19.51	Cultivated Crops	0.03
Developed-Medium Intensity	1.2	Mixed Forest	32.06	Woody Wetlands	3.82
Developed-High Intensity	0	Shrub-Scrub	2.62	Emergent Wetlands	0



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TOM POND, WARNER

2014 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (Refer to Table 1 and Historical Deep Spot Data Graphics)

- **CHLOROPHYLL-A:** Chlorophyll levels were elevated and increased from June to levels indicating bloom conditions in August. Historical trend analysis indicates stable chlorophyll levels with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and Outlet conductivity and chloride levels were slightly greater than the state medians. Historical trend analysis indicates highly variable epilimnetic (upper water layer) conductivity since monitoring began. This is likely a result of the high variability in water levels in the pond. Inlet conductivity and chloride were greater than the other stations following a significant rain event in July. This may have flushed pollutants into the tributary and pond.
- **E. COLI:** Inlet E. coli levels were low in July following the significant rain event; however Outlet E. coli levels were slightly elevated in July following the rain event. Outlet E. coli levels were very low in June and August and average levels were less than the state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus increased gradually from June to August and average levels were slightly less than the state median. Historical trend analysis indicates stable epilimnetic phosphorus with moderate variability between years. Hypolimnetic (lower water layer) phosphorus also increased gradually from June to August and was slightly greater than the state median. Inlet phosphorus was elevated following the significant rain event in July and the turbidity was also elevated. Outlet phosphorus increased gradually from June to August but remained fairly low.
- **TRANSPARENCY:** Transparency was good in June when algal growth was lower and then decreased in July and August when algal growth was higher. Average transparency improved slightly from 2013 and historical trend analysis indicates stable transparency since monitoring began.
- **TURBIDITY:** Epilimnetic, Hypolimnetic, and Outlet turbidities were low in June, and then increased in July and August during the period of heavy algal growth. Inlet turbidity was elevated in July following a significant rain event indicating potential erosion in the sub-watershed.
- **pH:** Epilimnetic pH was within the desirable range 6.5–8.0 units, however hypolimnetic pH levels decreased to below desirable in July and August. Historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH since monitoring began.
- **RECOMMENDED ACTIONS:** Phosphorus and chlorophyll levels have remained higher and variable since 2005. Prior to that, phosphorus levels were improving in the pond. The presence of beaver dams in the Outlet, backflow from the river, and the increased frequency and intensity of storm events since 2005 have ultimately led to the higher nutrient and algal growth in the pond. Install a staff gauge near the pond Outlet to regularly monitor and record water levels to help understand the degree to which they fluctuate. DES may be able to assist with the installation. Consult an environmental engineering firm to assess watershed hydrology and make recommendations on how to manage the factors affecting water quality. Maintain vegetated buffers along the pond's shoreline to help capture and infiltrate stormwater runoff and utilize DES' "NH Homeowner's Guide to Stormwater Management" as a reference for stormwater management on lake properties. Keep up the great work!

Station Name	Table 1. 2014 Average Water Quality Data for TOM POND								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m NVS	Turb. ntu	pH
Epilimnion	8.67	10.46	12	88.6		11	2.58	1.26	6.88
Hypolimnion				81.3		16		1.57	6.45
Inlet			38	177.0	30	29		10.7	6.37
Outlet				87.9	50	11		1.45	6.55

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m³

Conductivity: 40.0 uS/cm

Chloride: 4 mg/L

Total Phosphorus: 12 ug/L

Transparency: 3.2 m

pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: > 230 mg/L (chronic)

E. coli: > 88 cts/100 mL – public beach

E. coli: > 406 cts/100 mL – surface waters

Turbidity: > 10 NTU above natural level

pH: between 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Worsening	Data significantly decreasing.	Transparency	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.

